

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Paper Web Tension Governor

We, VEB PLAMAG PLAUENER DRUCK-
MASCHINENWERK, a corporation organised
under the laws of Eastern Germany, of 284
Pausaer Strasse, 99 Plauen/Vogtland, Ger-
many, do hereby declare the invention, for
which we pray that a patent may be granted
to us, and the method by which it is to be
performed, to be particularly described in
and by the following statement:—

10 The invention relates to a tension gover-
nor serving to keep the tension of a moving
web constant, especially of a paper web to
be utilised in a rotary printing machine.

15 In rotary printing machines the paper web
is subjected during working to constant ten-
sion fluctuations, which are instigated by
moisture and temperature influences and by
the action of machine parts which come into
contact with the paper web, for example in
20 the automatic sticking of a fresh roll to the
exhausted roll. Such tension fluctuations
lead to disturbances in the course of work
and to defects of quality in multi-colour
printing, in that the maintenance of register
25 of the print is disadvantageously influenced.

In the endeavour to conduct the paper web
through the machine with very largely con-
stant tension, paper web tension governors of
various constructions have been produced.
30 most of which work with a so-called sus-
pended or dancer roll lying in a loop of the
paper web. When elongation or shortening
of the web loop occurs, that is to say when
the web tension diminishes or increases, the
35 correspondingly shifted roll influences
mechanically, hydraulically, pneumatically
or electrically working control means which
act upon the paper roll drive or the paper
roll brake.

40 The arrangements known hitherto in part
work with excessive lag as a result of inertia,
and cause excessive waste paper. In some
cases the force exerted by the suspended roll

upon the web and opposing the traction of
the web is not uniform, so that over-regula- 45
tion occurs. This again leads to oscillations
of the governing system, which die away
only gradually, so that the tension of the
web seldom remains constant over a rela-
tively long period. 50

Among the number of known paper web
tension governors there are also those in
which the suspended roll influences a
potentiometer. In one case the potentio-
meter acts indirectly upon a brake generator. 55
in another case directly upon electro-
magnetically operated shoe-brakes mounted
on the paper roll cones.

It is also known to permit a potentiometer
influenced by a suspended roll to act alter- 60
nately on one of the induction brakes asso-
ciated with each paper roll, while in addition
to the automatically regulable potentiometer
there is provided a potentiometer adjustable
by hand according to a calibrated scale, for 65
the pre-selectable setting of the desired
brake effect.

Even these arrangements working with
potentiometers have the disadvantage that
either the force of the spring acting as return 70
element upon the suspended roll is different
in the different positions of the roll, or the
actual weight of the suspended roll acts to a
different extent upon the paper web. Ac-
cordingly even here a falsification of the con- 75
trol impulses occurs, so that it is not possible
to govern the web tension satisfactorily, that
is to say to keep it always most extensively
constant.

Now the invention is to provide a tension 80
governor in which the suspended roll acts
upon the paper web with a force which is
constant in every position.

For this purpose there is utilised a paper
web tension governor which works with a 85
suspended roll arranged in a loop of the web

[Price 4s. 6d.]

and sensing the web tension and a detecting element, for example a potentiometer, influenced by the suspended roll and controlling the drive or the brake of the paper roll.

5 According to the invention here with the mountings of the suspended roll there is coupled a motor-driven induction coupling with selectably induced torque, the direction of action of which is opposed to the paper web traction acting upon the suspended roll.

10 For a paper web tension governor with bilateral mounting of the suspended roll in movable slide pieces, each of which forms a link of an endlessly conducted chain, an advantageous embodiment is obtained according to the invention due to the fact that the induction coupling acts, possibly through a reduction gearing and a chain wheel, upon the chains carrying the suspended roll, which chains on shifting actuate the detecting element indirectly or directly for the control of the drive or of the brake of the paper roll.

The invention is also usable for paper web tension governors having a suspended roll provided with weight balancing and mounted on a pair of rocking levers, the arrangement being made such that the induction coupling is coupled with the shaft of the rocking levers of the suspended roll.

30 An example of embodiment of the invention is illustrated in simplified fashion in the drawing wherein:

Figure 1 shows a lateral elevation of the paper web tension governor; and

35 Figure 2 shows a front view along the section line A in Figure 1.

In a loop of the paper web 1 there lies the suspended roll 2, which is rotatably mounted with its journals 3, 4 in a slide piece 5, 6 in each case or in a trolley running on rollers. The slide pieces 5, 6 are held by guides 7, 8 so that in the example of embodiment as illustrated they can move only linearly. On the slide pieces 5, 6 there engages in each case a chain 9, 10, which chains are endlessly conducted over the chain wheels 11, 12 and 13, 14, the slide pieces 5, 6 to a certain extent forming a link of the pertinent chain.

50 On the chain wheel shaft 15, firmly connected with the chain wheels 11, 13, there is secured the induction coupling 16, the part of which that is rotatably mounted on the chain wheel shaft being driven by the motor 17 with constant speed, with step down through the gear wheels 18, 19, it also being possible to permit the motor to drive the induction coupling directly and to interpose the reduction gearing between the coupling and the chain wheel 11. A constant tension of selectable magnitude can be induced in the induction coupling 16 from a potentiometer (not shown).

A detecting element in the form of a

65 potentiometer 22 is actuated by the chain wheel shaft 15, firmly connected with the chain wheels 11, 13, through the pinions 20, 21. It is however also readily possible in place of the potentiometer to use a photo-electrically or electro-mechanically working induction transmitter, the operation of which can also take place by means of a part shifted in dependence upon the movements of the suspended roll. The setting means usable for this purpose are of many kinds known per se and do not need to be described in greater detail.

The idea of the invention is naturally also usable for those arrangements where the suspended roll is not guided linearly, but is for example suspended on a pair of rocking levers. In order to exclude the influences of their own weight upon the control actions, the rocking levers can be provided with a balance weight. In order to generate a constant force opposing the traction of the paper web, the induction coupling is coupled with the shaft of the rocking levers.

WHAT WE CLAIM IS:

1. A paper web tension governor having a suspended roll arranged in a loop of the web and sensing the web tension and a detecting element, for example a potentiometer, influenced by the suspended roll and controlling the drive or the brake of the paper roll, wherein with the mountings of the suspended roll there is coupled a motor-driven induction coupling with selectably induced torque, the direction of action of which is opposed to the paper web traction acting upon the suspended roll.

2. A paper web tension governor according to claim 1 having bilateral mounting of the suspended roll in movable slide pieces, each of which forms a link of an endlessly conducted chain, wherein the induction coupling acts, possibly through a reduction gearing and a chain wheel, upon the chains carrying the suspended roll which chains on shifting indirectly or directly actuate the detecting element for the control of the drive or of the brake of the paper roll.

3. A paper web tension governor according to claim 1, having a suspended roll provided with a balance weight and mounted on a pair of rocking levers, wherein the induction coupling is coupled with the shaft of rocking levers operating on the suspended roll.

4. A paper web tension governor substantially as described with reference to and as illustrated in the accompanying drawing.

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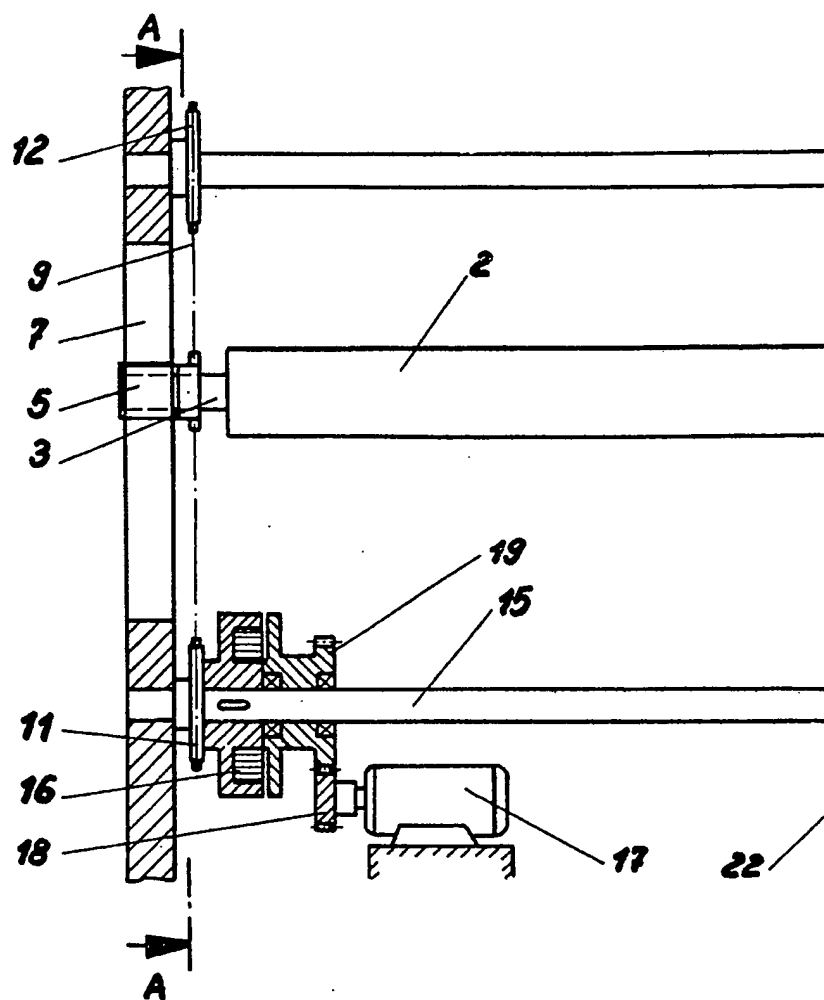


Fig. 1

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1 SHEET

This drawing is a reproduction of
the Original on a reduced scale.

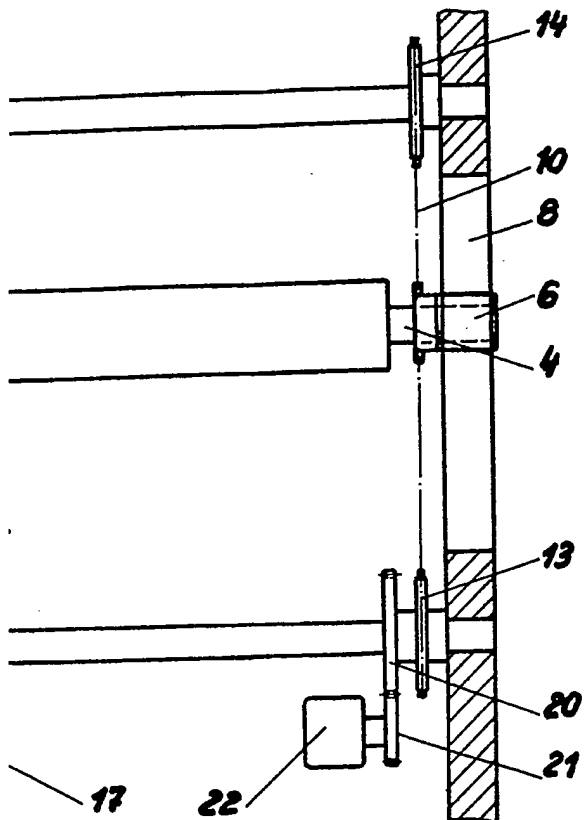


Fig. 1

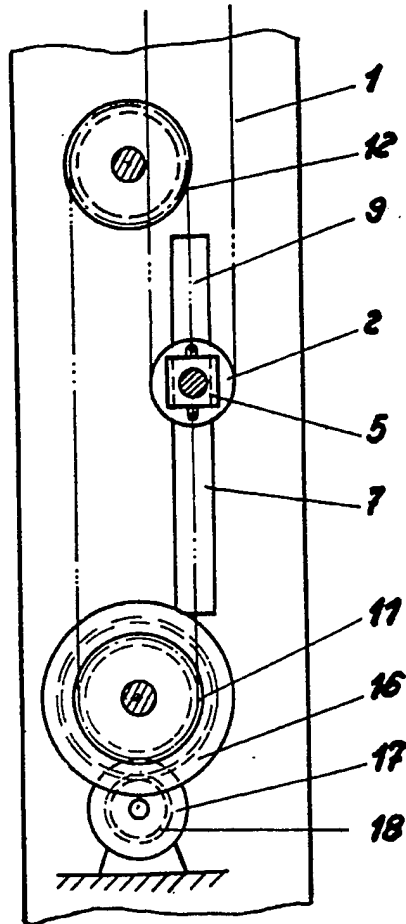


Fig. 2

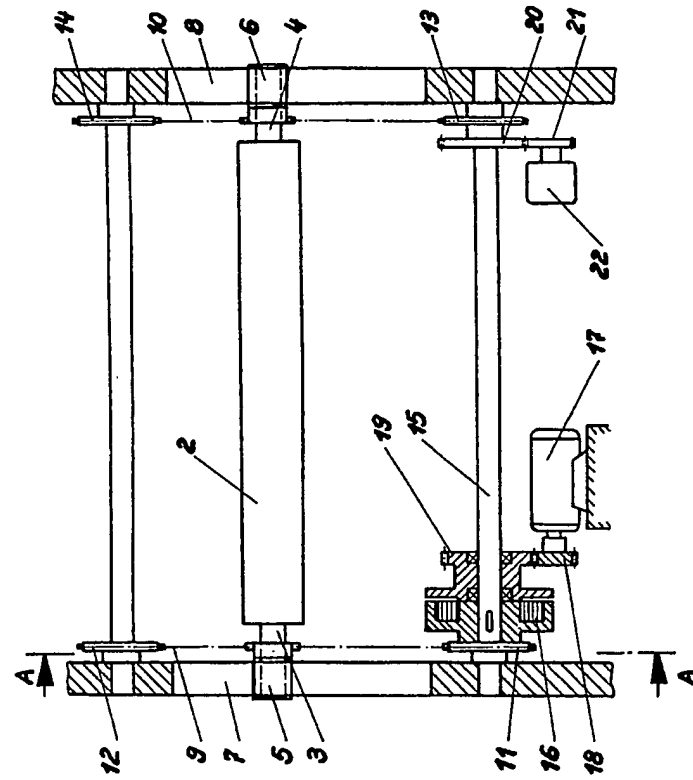


Fig. 1

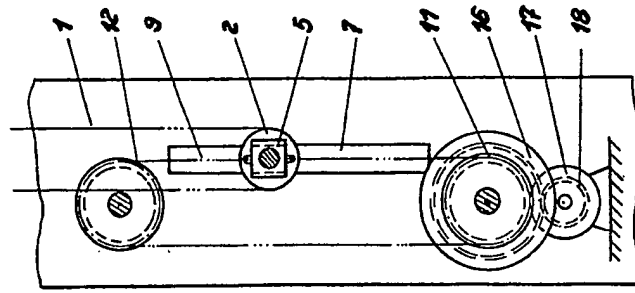


Fig. 2